

Arctic Ocean Model Intercomparison Project (AOMIP): Travel Support for Workshops

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LONG-TERM GOALS

Our long-term goal is to improve arctic sea ice – ocean numerical models by fostering communication and collaboration among the international modeling community.

OBJECTIVES

The specific objective of this project is to fund travel to AOMIP workshops by scientists who are new to the field (e.g, graduate students and post-docs), with additional funding for use by Navy modelers and by other key senior modelers who provide insight for the younger scientists.

APPROACH

PI Steele works closely with AOMIP PI Andrey Proshutinsky (WHOI) to organize workshops, including time for talks on current research, break-out sessions, review talks designed to assess the current state of the field, and social activities.

WORK COMPLETED

The second AOMIP workshop to use ONR funding took place at WHOI October 20-22, 2010. Eighty scientists came to WHOI from the US, Canada, China, England, France, Germany, Italy, Norway, Poland, Russia, and Sweden. Additional local WHOI scientists participated in discussions during the week. There were 38 talks and 25 posters presented. Talks were grouped according to the following themes:

- Arctic Ocean state and variability
- Sea ice and ice-related modeling and observing
- Fresh water fluxes, transformations and trends
- Arctic Ocean circulation, exchanges and effects
- Models, model performance and observations
- Biogeochemistry and ecosystem modeling

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Before the official first day of the workshop, we held the second “AOMIP School for New Arctic Scientists” on October 19, where 6 invited overview talks were presented, with plenty of time left for questions and discussions. These talks were:

- Jennifer Hutchings (IARC): Sea Ice Dynamics Overview: What role do ice dynamics play in a changing Arctic?
- Mary-Louise Timmermans (Yale): Dynamics in the deep Arctic Ocean
- Xiangdong Zhang (IARC): Atmospheric Reanalysis Data: Detection, Attribution, and Application in Arctic Climate Change Studies
- Jamie Morison (UW): Observations of Interannual Variability of Arctic Ocean Circulation: Water Samples to Satellites
- David Holland (NYU): A review of ice sheet - ocean interactions: Observations and modeling
- Rebecca Woodgate (UW): Getting around in the Arctic - what we do (and don't) know about boundary currents

We also arranged a 1.5 hour tour of the WHOI fluid dynamics tank lab plus the carbon isotope center, and organized an evening dinner meeting where senior scientists gave more details on emerging “hot topics” in the field and the young scientists had time to introduce themselves and speak about their concerns as they begin their careers.

This ONR grant supported travel for 25 scientists:

1. Jennifer Hutchings (IARC): AOMIP school lecturer
2. Mary-Louise Timmermans (Yale): AOMIP school lecturer
3. Xiangdong Zhang (IARC): AOMIP school lecturer
4. Jamie Morison (UW): AOMIP school lecturer
5. Rebecca Woodgate (UW): AOMIP school lecturer
6. Loubna Benyahya (UQAM): grad student
7. Oceana Francis (UAF): grad student
8. David Hebert (NRL): post-postdoc
9. Jackie Clement-Kinney (NPS): grad student
10. Nikolay Koldunov (Hamburg U): postdoc
11. Helene Langehaug (Bergen): grad student
12. Maria Luneva (NOC): new to arctic modeling
13. Sebastian Martensson (Stockholm U): grad student
14. Alex Matveev (UQAM): grad student
15. Tim McGeehan (NPS): grad student
16. An Nguyen (JPL): post-postdoc
17. Laura Niederdrenk (MPI): grad student
18. Robert Osinski (NPS): post-postdoc
19. J-P Paquin (UQAM): grad student
20. Per Pemberton (Stockholm): grad student
21. Cecilia Ferriz (UW): grad student
22. Pierre Rampal (MIT): postdoc
23. Gunnar Spreen (JPL): postdoc
24. Qiang Wang (Alberta U): grad student
25. Evgeniy Yakushev (NIV): new to arctic modeling

All supported scientists gave talks or posters. Grant funding was also used to encourage participation of Navy modelers. David Hebert from NRL in Stennis, Mississippi was able to attend, as were Jackie Clement-Kinney and Tim McGeehan from the Naval Postgraduate School in Monterey, CA.

On the last day of the meeting, break-out groups discussed coordinated experiments that are ongoing, some to be submitted as papers for a special issue of JGR on recent AOMIP intercomparison projects. These include model-data intercomparisons of Bering Strait inflows, freshwater outflows, halocline water formation, the role of eddy transport, idealized wind-driven simulations, ecosystem forcings, mixed layer depth, and Beaufort Gyre dynamics. Most of these include the active participation of young scientists.

RESULTS

A main result of this workshop is that younger modelers and those new to the field have gained an invaluable insight into the state-of-the-art. Dr. Proshutinsky and I were told by many participants during the course of the meeting that the AOMIP School in particular was very useful to them. We were also told by several senior, “new-to-the-field” scientists that our meeting was unusually open to new ideas and new people, in comparison with other oceanographic focus groups that they have participated in. Dr. Hebert from NRL was very positive about his experience. We are still in the process of collecting feedback from this meeting.

A significant result from this workshop is an ongoing effort to perform coordinated model experiments to better understand model deficiencies and how to correct them. Some of these projects are in the final stages, in preparation for submission to a special AOMIP issue of JGR by the end of calendar year 2010.

For example, a graduate student from NPS in Monterey, Jackie Clement-Kinney, is leading an intercomparison of model and observations of volume, heat, and freshwater transports through Bering Strait. Findings indicate that high resolution models predict ~15% lower volume flux through the strait, relative to lower resolution models and relative to previous observational estimates based on sparse data. This has implications for modeling the flow of these waters within the Arctic Ocean and even downstream into the North Atlantic Ocean.

IMPACT/APPLICATIONS

Potential future impact of AOMIP activities is the improvement of models and observation strategies. In particular, the future impact of exposing young and new-to-the-arctic scientists to the state-of-the-art in arctic modeling is an enhanced capability for more accurate modeling and scientific discovery.

RELATED PROJECTS

None